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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/073,119

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Johannes Jacobus Matheus Baselmans

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EXAMINER

NGUYEN, HUNG

ART UNIT

PAPER NUMBER

2851

DATE MAILED: 03/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/073,119

Applicant(s)

BASELMANS ET AL.

Examiner

Hung Henry V Nguyen

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2851

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 1 and 10, the recitation of the terms “*substantially* coincident ” renders the claims indefinite. That is, when a term of degree is used as a limitation, it is necessary to determine whether the specification provides some standard for measuring that degree. In this case, the specification does not enable one skilled in the art to reasonably establish what may be construed as being within the metes and bounds of the term of degree. Therefore, one of ordinary skill in the art would not be apprised as to the claimed invention’s scope when the claims are read in light of the specification.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

As best the claimed subject matters are understood (see rejection under 35 U.S.C. 112, second paragraph, *supra*). The claims are anticipated by reference. The applicant is reminded that the claimed subject matter to examination will be given their broadest reasonable interpretation consistent with the specification, and limitations appearing in the specification are not be read into the claims. In *re Yamamoto*, 740 F. 2d 1569, 1571, 222 USPO 934, 936 (Fed.Cir. 1984). With this in mind, the rejection herein will focus on how the terms and relationships thereof in the claims are met by the references. Response to any limitation that is not in the claims or any argument that is irrelevant to or does not relate to any specific claimed language will not be warranted.

Claims 1-2, 4-5, 7-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Naulleau et al (U.S.Pat. 6,233,056).

With respect to claims 1-2 and 9-10, Naulleau et al (U.S.Pat. 6,233,056) discloses a lithographic projection exposure apparatus and a corresponding method comprising all basic structures as set forth in the instant claims such as: a radiation system (47) for providing a project beam of radiation; a mask (34) having a predetermined pattern formed thereon and is placed in an object plane; a substrate stage for holding the substrate (50,54); a projection optical system (32) for projecting the pattern formed on the mask onto the substrate; an interferometer measurement system (48) for measuring wave front aberrations of the projection optical system and comprising a grating with a grating pattern in a grating plane (38) which is movable into and out of the projection beam via a motor actuated stage (52) such that the grating plane is "substantially coincident" with the object plane; a pinhole with a pinhole pattern in a pinhole plane and arranged in a pinhole plate (46), which is movable into and out of the projection beam

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via a motor actuated stage (54) such that the pinhole plane is “substantially coincident” with a plane downstream of the projection optical system and optically join together to the mask plane; and a detector (48) having a detector surface “substantially coincident” with a detection plane which is placed down stream of the pinhole “at a location where a spatial distribution of the electric field amplitude of the projection beam is substantially a Fourier transformation of a spatial distribution of the electric field amplitude of the projection beam in the pinhole plane” (see fig.5 and col.7, lines 43-52; col.10 lines 45 thru col.12 line 25).

With respect to claims 4-5, 7-8, Naulleau teaches the grating is provided at a location away from a location for holding the mask (see fig.1A for example) and “the detector is provide to the substrate table” (see fig.5) and “the pinhole plate is provided to the substrate table” (see col.7, lines 38-41).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naulleau et al (U.S.Pat. 6,233,056).

With respect to claim 3, Naulleau teaches an lithographic exposure device comprising substantially all of the limitations of the instant claim as discussed above. Naulleau does not expressly disclose the grating module being held by the mask table at a location for holding the

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mask. However, Naulleau suggests that the grating (38) can be mounted on motor actuated stage (52) to have suitable rotational, translational and longitudinal controls for precise maneuvers and alignment. This provides a clear suggestion that it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the teachings of Naulleau to obtain the invention as specified in claim 3. It would have been obvious to a skilled artisan to dispose the grating on the mask table at the location for holding the mask. The at least purpose of doing so would have been to obtain simplification of the structure and to reduce the physical size of the exposure apparatus and whereby the cost of the exposure apparatus as whole can be greatly reduced.

Allowable Subject Matter

6. Claims 6 and 11-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: the prior art of record either alone or in combination, neither discloses nor makes obvious a lithographic exposure system comprising an interferometer measurement system with a grating, a pinhole, and a detector where the measurement system comprises a lens with a specific structures as recited in claim 6.

With respect to claims 11-15, the prior art of record fails to teach or suggest a method of measuring wave front aberrations of a projection system in a lithographic projection apparatus where the grating pattern comprises a grating period satisfying conditions as recited in claims 11-14, as well as specific steps as recited in claim 15.

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Prior Art Of Record

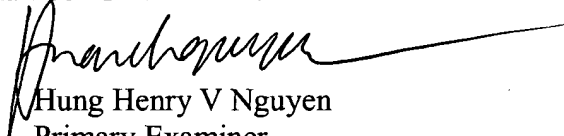
8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Shinonaga et al (U.S.Pat. 5,760,879), Ohsaki (U.S.Pat. 6,78,514), Suzuki et al (U.S.Pat. 5,898,501) discloses exposure apparatus and method for measuring and detecting aberrations of an projection optical system; Cithara et al (U.S.Pat.6,456,382) discloses a wave front aberration measuring interferometer and has been cited for technical background.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Henry V Nguyen whose telephone number is 703-305-6462. The examiner can normally be reached on Monday-Friday (First Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Russ Adams can be reached on 703-308-2847.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4900.


Hung Henry V Nguyen
Primary Examiner
Art Unit 2851

hvn
March 14, 2003